

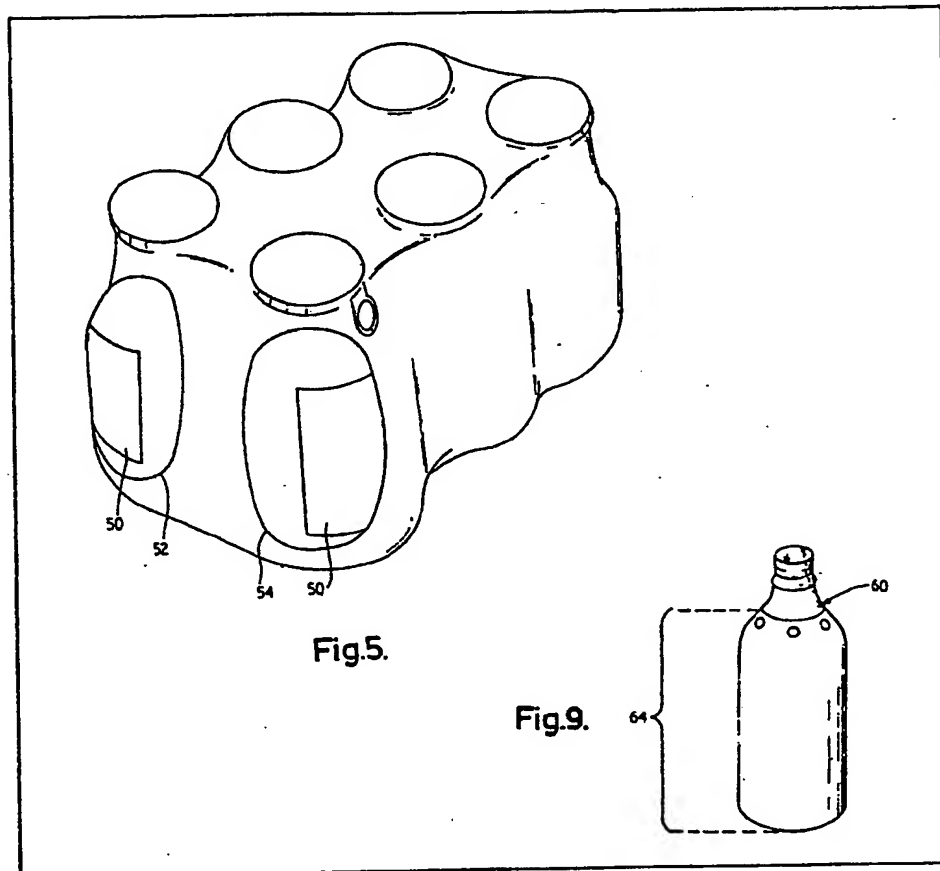
(12) UK Patent Application (19) GB (11) 2 025 352 A

- (21) Application No 7829708
(22) Date of filing 13 Jul 1978
(23) Claims filed 13 Jul 1978
(43) Application published
23 Jan 1980
(51) INT CL³
B65D 75/02 71/06 // 65/22
(52) Domestic classification
B8C 12B8 12D2 17A 24B5 29A
B8D 1E 7G 7P1 7PY CW23
(56) Documents cited
GB 1493727
GB 1426612
GB 1410392
GB 1403912
GB 1375421
GB 1326629
GB 1322453
GB 979160
(58) Field of search
B8C
B8D
(71) Applicant
Frederick Douglas Clavell
Bate, 155 Barkerhouse
Road, Nelson, Lancashire
(72) Inventor
Frederick Douglas Clavell
Bate
(74) Agents
Appleyard, Lees & Co.

(54) Wrapping articles

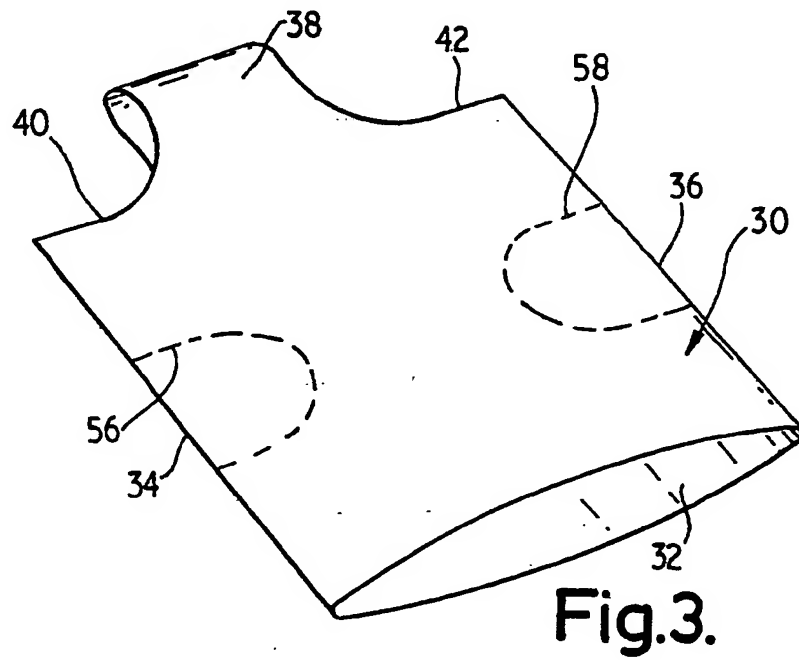
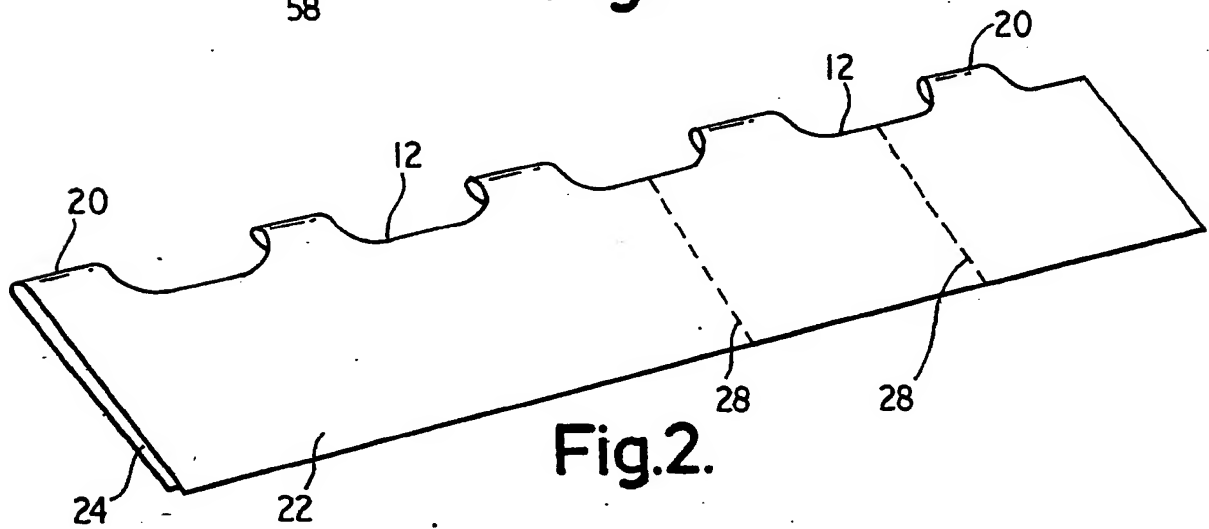
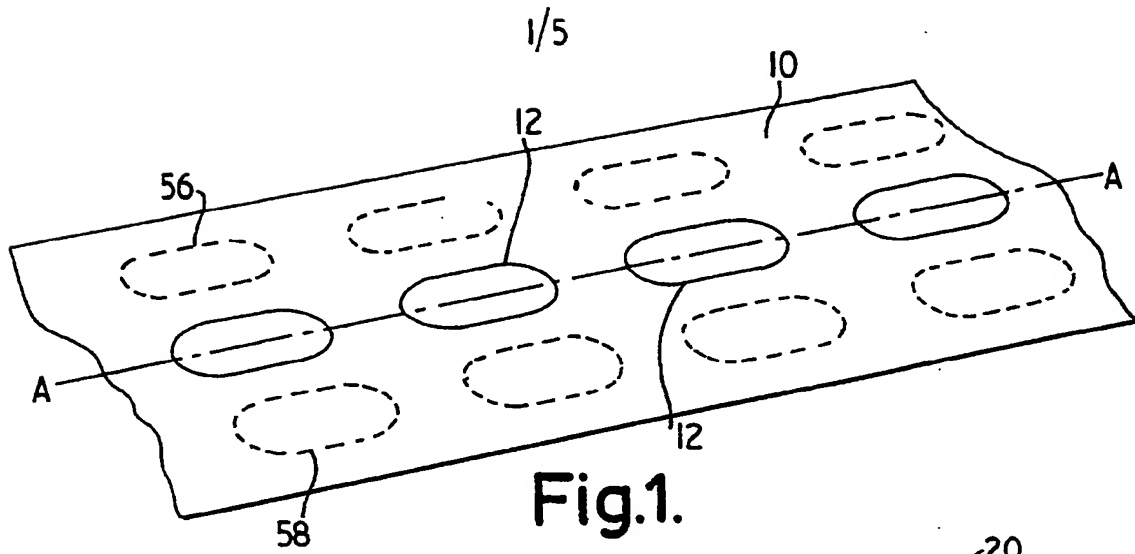
(57) A pack includes one or more articles, e.g. bottles, cans or cartons closely embraced by a wrapping which is so shaped, that it has no substantial excess material to form ears, or otherwise distort the smooth fitting of the wrapping on to the article(s). The wrapping may be formed from a heat-shrinkable or stretchable film. In one method of producing a pack (Fig. 5) a group of bottles is embraced by a wrapping

which is bag-like and has cut-outs in the region of corners of the closed end of the bag. Such a wrapping is formed by transversely heat-sealing and severing a longitudinally folded web provided with cut-outs. In another preferred method (Fig. 9) a single bottle is embraced by a wrapping having an aperture for the bottle neck surrounded by holes. This wrapping is also formed by transversely heat-sealing and severing a longitudinally folded web provided with cut-outs for the aperture and holes.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

GB2 025 352 A



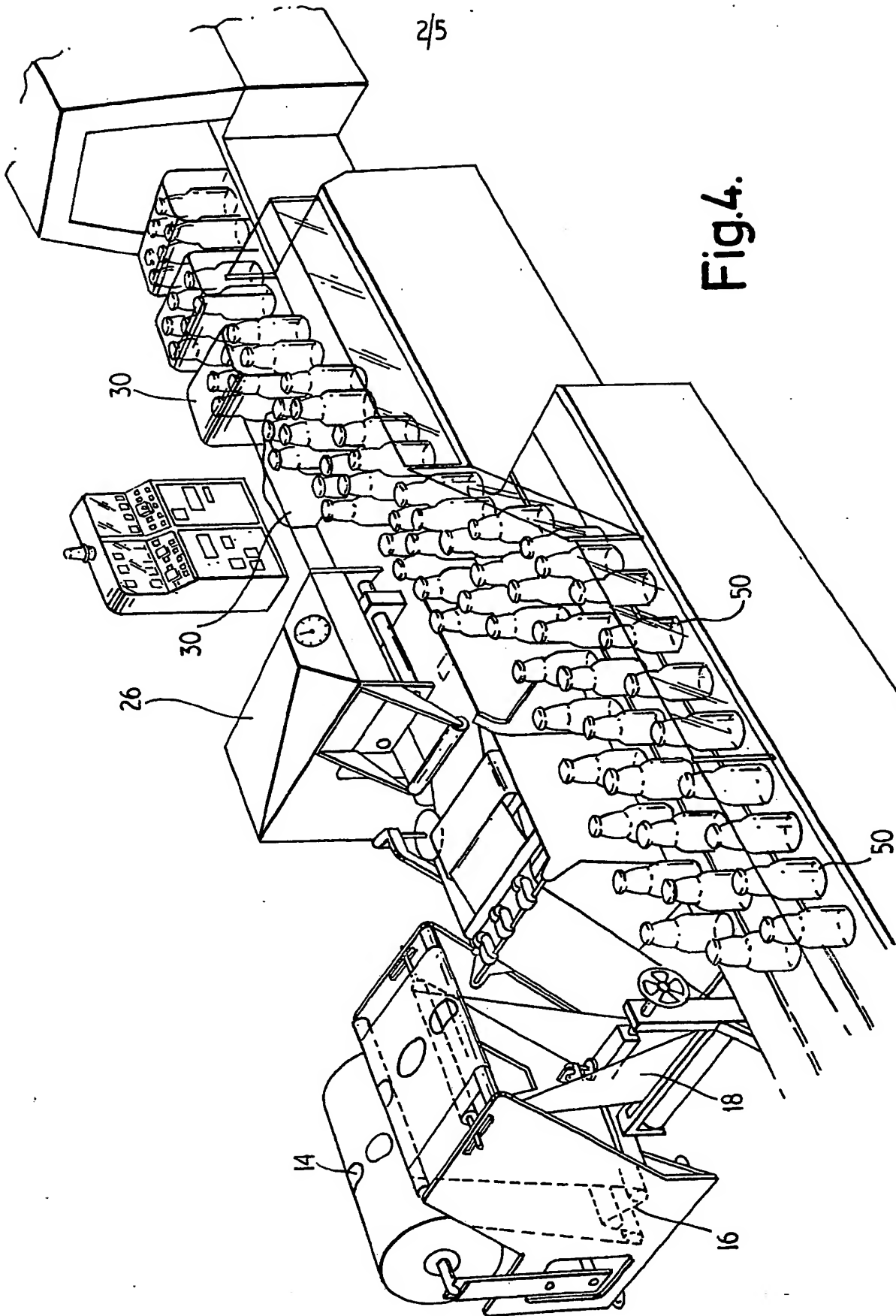


Fig.4.

2025352

3/5

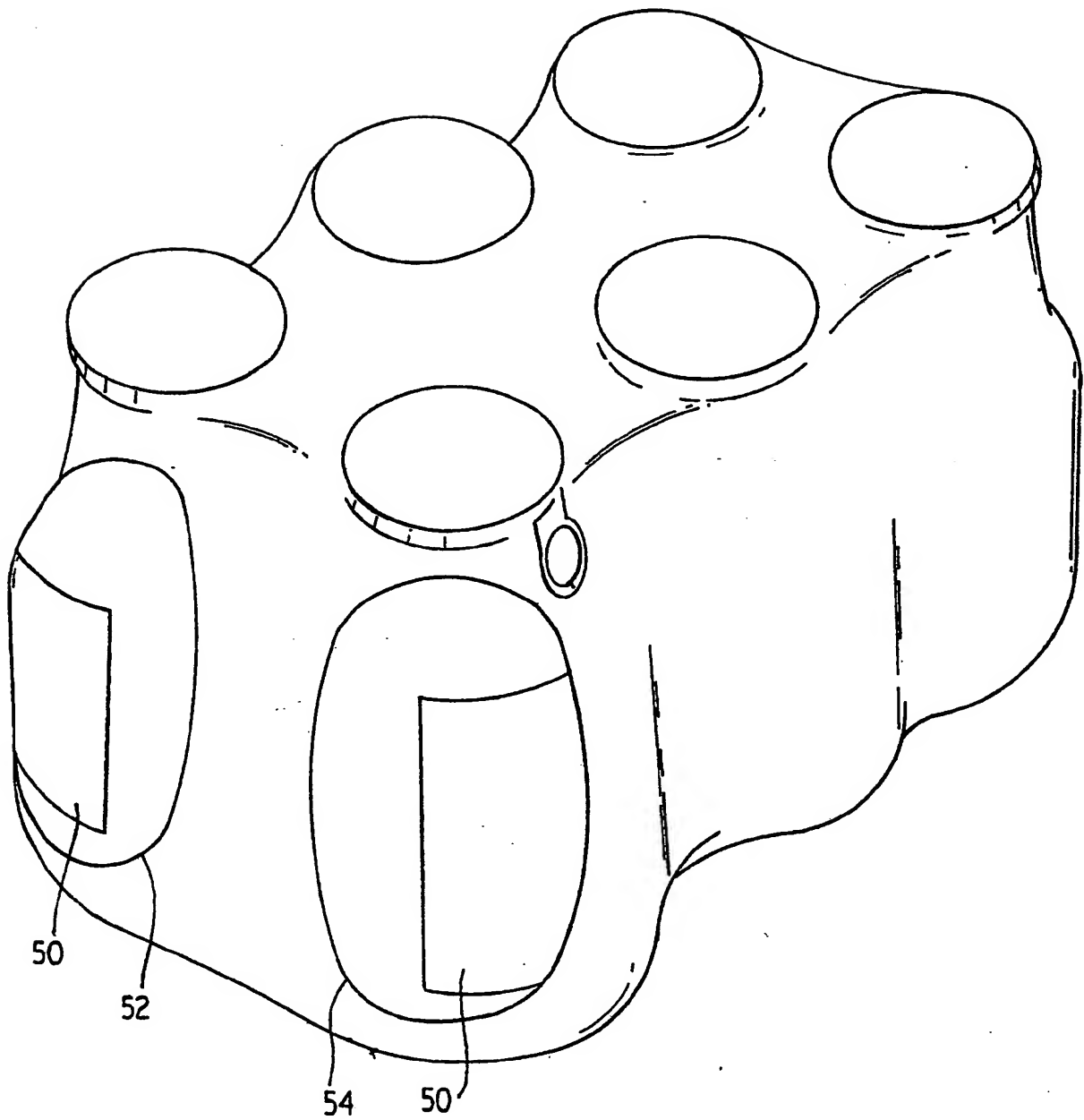
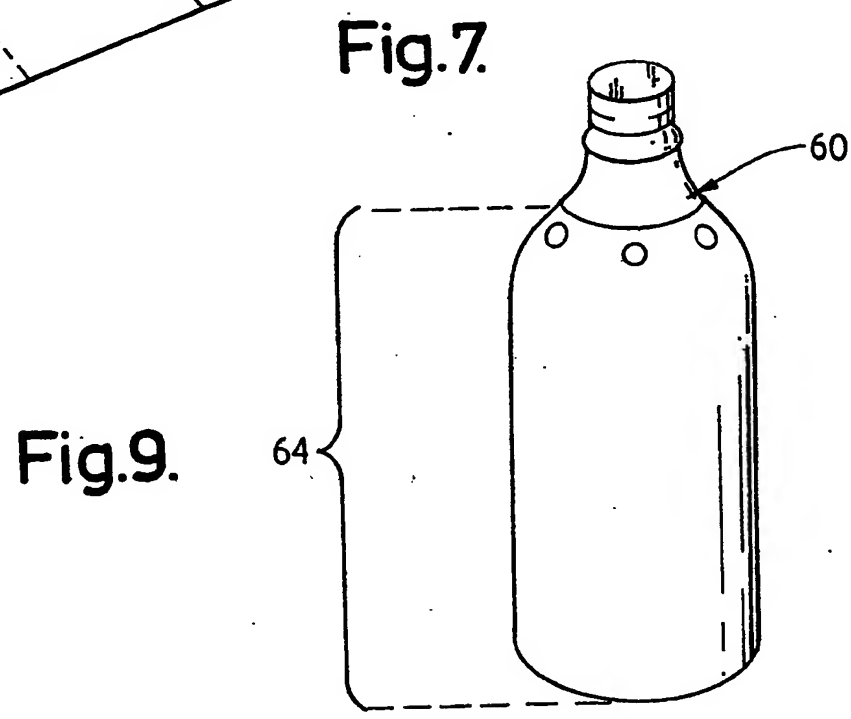
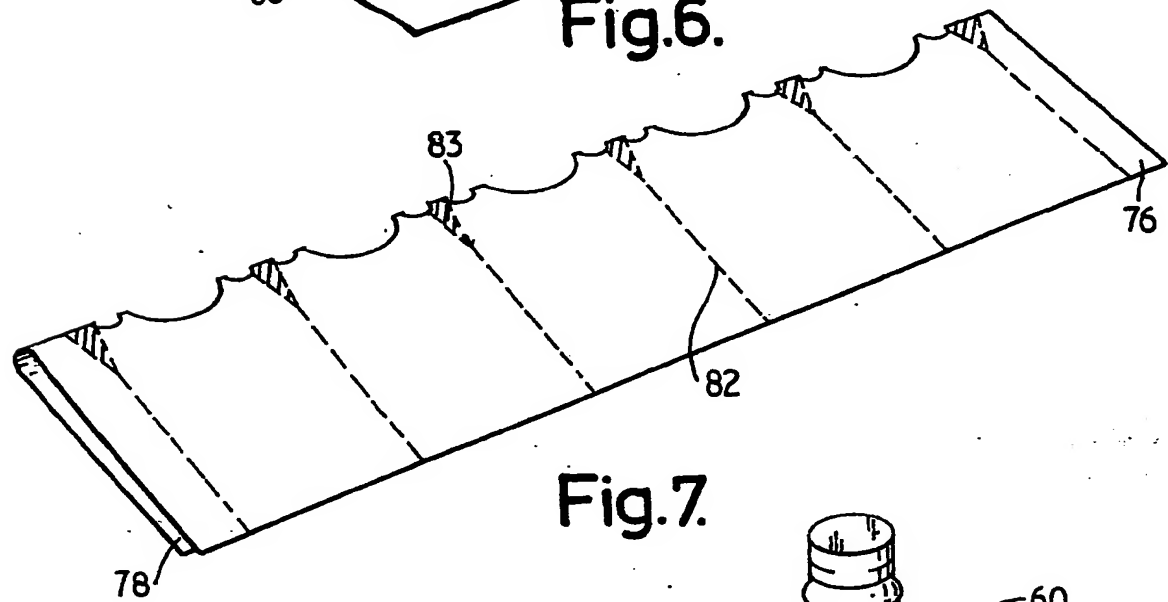
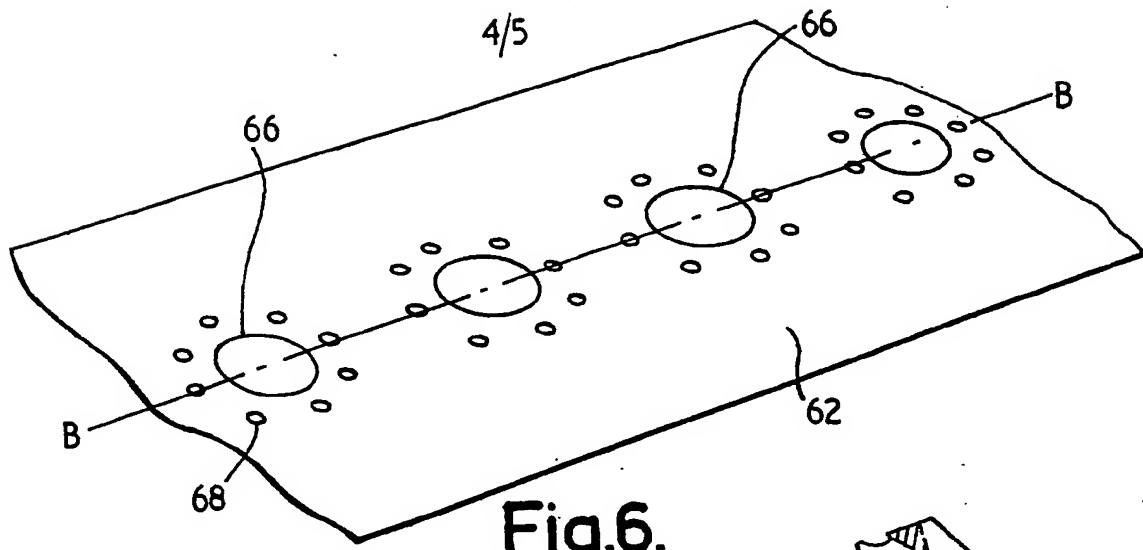


Fig.5.



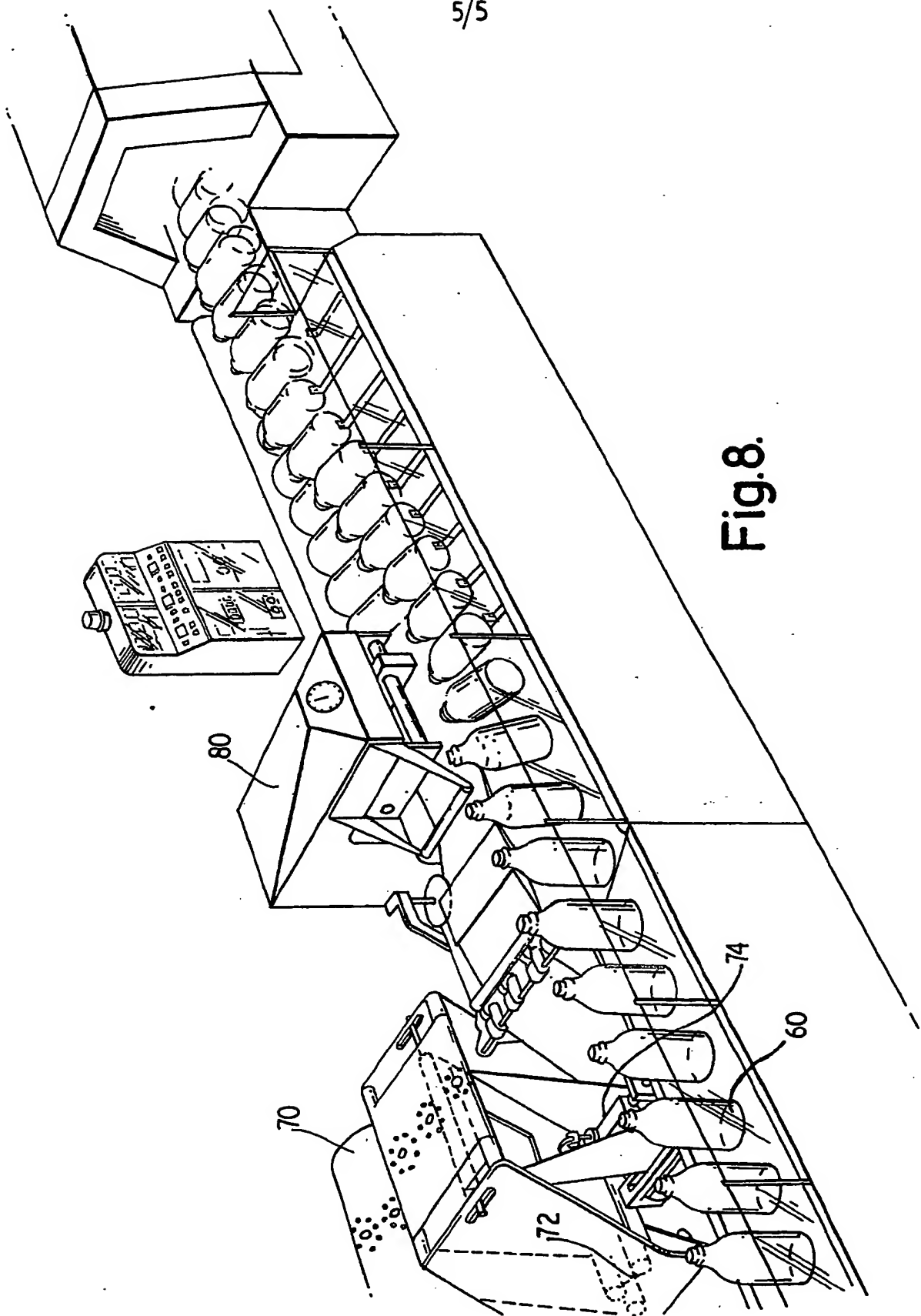


Fig.8.

SPECIFICATION

A method of packaging; packaging material and packages

The present invention is concerned with the packaging of solid articles, or collations of solid articles. The term "collation" is used throughout this specification to describe a set of articles, which will generally be identical in external dimensions, and which have been brought together for the purpose of forming a single pack. By way of example, the invention can be used to package bottles, either individually, or in collations of two, four, six, or eight. It would of course be possible to produce collations having more than eight articles, but in the case of bottles, these have heretofore been generally supplied in packs of four or six.

In a particular application, the invention is used to package collations of wide mouthed bottles containing beverages, and in another particular application, the invention is used to provide a protective wrapping around a single bottle containing a carbonated beverage. It is to be understood however, that the invention can be used for the packaging of a very wide variety of solid articles, or collations of such articles.

One of the problems which arises in packaging solid articles, where the article has an appreciable width and depth, is that if the wrapping is preformed into a tube or bag, then when the article or collation is inserted into the tube or bag, and the ends of the wrapping drawn against the article or collation, there are excess portions of wrapping material, which usually appear as ears or other distortions in the finished pack. For instance, if a collation of say six bottles is inserted into a film bag, and the bag is then shrunk by the known shrink wrapping process on to the bottles, two large ears appear at the closed corners of the bag, and these ears are flattened on to the end or the sides of the pack. However, this presents a somewhat unsightly finished pack.

It is the primary object of one aspect of the present invention therefore, to provide a method of forming a pack, such that the problem of ear formation or similar distortion of the wrapping material is mitigated or completely obviated. It is a further object of the invention, to provide a pack comprising a solid article or a collation of articles closely embraced by a smooth wrapping, which presents a pack of pleasing appearance.

According to one aspect of the invention, in a method of forming a pack comprising a solid article, or a collation of solid articles closely embraced by a wrapping, the wrapping is shaped so that it has no substantial excess material to form ears or otherwise distort the smooth fitting of the wrapping on to the article or collation. By the simple expedient of shaping the wrapping material so that when the article or collation is inserted, and the wrapping material pressed closely on to the article or collation, there is an absence of that wrapping material which would otherwise form ears or other distortions, one is able to produce a

finished pack of smooth appearance. Because of the shaping necessary to remove the otherwise excess material, the wrapping of the finished pack may have one or more holes at the position or positions, where the ears or other distortions would have appeared, but these holes need not detract from the finished appearance of the pack. Indeed, in some instances, such holes can enhance the appearance of the pack, and they can be used to expose regions of the articles or collation bearing labelling, advertising or other printed matter.

Preferably the wrapping is preformed to the required shape before the article or collation is inserted into it. It is further preferred that the wrapping is formed into an open-ended tube before the article or collation is inserted into it.

According to another preferred feature of the invention, the wrapping is preformed into a bag, open at one end, and cut-away portions at what would otherwise be the closed corners of the bag, before the article or collation is inserted into it, and the article or collation is pressed into the bag to tension the closed end of the bag over the article or collation, whereby the edges of the cut-away portions engage on the exterior of the article or collation. If the preferred method is employed, then portions of the article or collation project through the holes formed by the cut-away portions, but the wrapping is stretched tightly around the article or collation. Tight wrapping is particularly desirable, in the case of a collation, because in that case, the wrapping maintains the collation as a self-supporting unit for display or transportation purposes.

According to another preferred feature, the wrapping is stressed around the article or collation. This may be achieved either by shrinking the wrapping on to the article or collation, as in a shrink wrapping process, or by employing stretchable wrapping material, and stretching the wrapping around the article or collation. The process may also include the step of forming one or more cut-away portions in the wrapping, additional to any such cut-away portions required to obviate ears or other distortions. Besides reducing the amount of wrapping material actually used in the formation of the pack, such additional cut-away portions can be used to expose labelling or other advertising matter on an article in the pack.

A preferred method in accordance with this first aspect of the invention comprises the steps of: forming a bag opened at one end and having cut-away portions at what would otherwise be the closed corners of the bag; inserting a plurality of articles formed into a collation through the open end of the bag, and tensioning the bag around the articles, so that the edges of the open mouth of the bag contract on to one end of the plurality of articles and engage with that end of the plurality of articles, and so that the edges of the cut-away portions contract onto and engage with the opposite end of the plurality of articles.

Distortions of the wrapping material also arise

out of changes in the cross-sectional shape of the article which is being wrapped. For example in the case of a conventional bottle, if the bottle is pushed into a sleeve of wrapping material, and then that sleeve is stressed into engagement with the exterior of the bottle, there will be wrinkling or bubbling of the wrapping material around the necked portion of the bottle, and this produces an unsightly appearance.

10 According to a second aspect of the invention, a method of forming a pack containing an article of varying cross-sectional shape, comprises the steps of: forming a tube of wrapping material, with one or more holes in the material at a position or positions corresponding to an area or areas of reduced cross-section of the article to be wrapped, inserting the article into the tube, and stressing the tube on to the outside of the article, so that the holes substantially remove what would otherwise be excess wrapping material, which distorts the wrapping. The tube may be closed at one end, so that it forms a bag, in which case the article is introduced through the open end of the bag.

20 According to a third aspect of the invention, a method of forming a wrapping for packaging goods, comprises: forming a series of longitudinally spaced holes in a length of wrapping film; folding the film along a longitudinal line passing through the series of holes, so that the two parts of the film on opposite sides of the fold line are brought into overlying relationship with each other; traversing the folded film in a longitudinal direction, and forming seals between these two parts of the film, along transverse lines each of which intersects one of the series of holes, so that each wrapping formed between adjacent seals comprises a bag open along one longitudinal edge and having cut-away portions at what would otherwise be the closed corners along the opposite longitudinal edge. Preferably the wrapping is severed along each transverse seal so that each bag is completely detached from the bag in front of it, and from the film supply following it. One or more additional series of longitudinally spaced holes may be formed in the wrapping film along a line or lines laterally spaced from the first series of holes.

30 According to a fourth aspect of the invention, a packaging material comprises a long length of wrapping film having a series of longitudinally spaced holes formed in it, the width of each hole lying within the range 10% to 30% of the width of the film, the lateral position of the series of holes being such that the longitudinal centre line of the film passes through the holes. Preferably the length of each hole lies within the range 10% to 30% of the width of the film.

40 Since the depth of the hole formed in the wrapping of the completed pack is determined by the width of the hole in the packaging material, it has been found that in order to successfully remove the ears which would otherwise be formed, it is necessary to have the width of the hole within the range 10% to 30% of the width of the film. If the hole has a width (and therefore a

depth in the finished pack) of less than 10% the width of the film (the width of the film being double the length of the pack if the film is centre folded) then the pack would be so long relative to its depth, that the method of packaging according to the invention might not be acceptable. On the other hand, it is quite impossible for the depth of the hole in the finished pack to extend over 50% of the wrapping material, and in practice this depth cannot exceed 30% of the width of the film.

70 The packaging method in accordance with the first two aspects of the invention, the method of forming a wrapping in accordance with the third aspect of the invention, and the packaging material in accordance with the fourth aspect of the invention, are all particularly suitable for use in methods of forming packages and on the apparatus as described in the specifications of United Kingdom Patents Nos: 1,438,961; 1,430,943; 1,438,952 and 1,438,953. One of the significant features of the wrapping method described in those United Kingdom Patent Specifications, is that opening means are inserted into the wrapping pack, whilst the latter is in a collapsed condition, and then after the pack has been sealed and severed from the packs in front of it and the supply of material following it, the opening means are operated to extend the pack, to allow the article or collations of articles to be wrapped, to be inserted into the opened packaging material.

80 Methods of forming two kinds of pack, each in accordance with one or more aspects of the invention, will now be described by way of examples only, with reference to the accompanying drawings, in which:—

85 Figure 1 is a perspective view of wrapping film for use in a first method,

100 Figure 2 is a perspective view of the wrapping film after it has been centre folded,

105 Figure 3 is a perspective view of a single bag,

Figure 4 is a perspective view of a wrapping machine, showing bottles being formed into packs of six,

110 Figure 5 is a perspective view of a finished pack of six bottles,

Figure 6 is a perspective view of a wrapping film for use in the second method,

115 Figure 7 is a cross-section through a wrapping bag formed from the material shown in Figure 6,

Figure 8 is a perspective view of a wrapping machine showing the formation of a wrapping around a large single bottle, and

120 Figure 9 is a perspective view of a finished wrapped bottle.

So-called wide mouthed bottles have recently been developed for containing beverages such as beer, fruit juices and soft drinks. Because the mouth of such a bottle is considerably wider than that of a conventional bottle, it permits drinking direct from the bottle but at the same time, the so-called wide mouthed bottles have a sufficiently necked appearance, to clearly distinguish them from jars. Such bottles can be made cheaply enough to compete commercially with cans, and

they can also be provided with tear-off caps. It is desirable to package these wide mouthed bottles in groups of say four or six, to facilitate marketing through super markets, and transportation. Ideally, any packaging should be cheap and produce a finished pack having a smooth exterior. Further, the collation of bottles should be as rigid as possible to stand up to handling in transportation, and it is frequently also desirable that the wrapping material shall be transparent, or at least translucent, so as to permit the labels on the bottles to be readable through the packaging.

Referring to Figure 1, there is illustrated part of a wrapping film 10 which is made of polyvinylchloride, or polyethylene, and which in this particular instance, is of the type which is susceptible of shrinkage under applied heat. Shrink wrapping films are well known and are used for a variety of purposes. The film 10, is manufactured in long lengths, and will normally be supplied on a reel. In the present instance, where it is intended to form a finished pack of six wide mouthed bottles each approximately 70 millimetres diameter and 130 millimetres tall, the film 10 has a width of 600 millimetres.

A series of generally oval holes 12 with flattened side edges, is formed in the film at longitudinally spaced positions, along the longitudinal center line of the film (indicated at "A"—"A" in Figure 1). The major axis of each hole 12, lies on the center line "A"—"A", the length of each hole being approximately 220 millimetres, and the width of each hole being approximately 110 millimetres.

The packaging of the bottles is carried out on a machine illustrated somewhat diagrammatically in Figure 4, which is of the type described in the Specifications of United Kingdom Patents Nos: 1,438,961; 1,430,943; 1,438,952 and 1,438,953. Since the construction and operation of the machine itself is thoroughly described in those Patent Specifications, it is unnecessary to describe it in detail here, and reference will only be made to certain features of the machine which are necessary for an understanding of the present invention. It is to be understood however, that it is intended to incorporate the entire disclosure of each of the four United Kingdom Patent Specifications referred to above, in the description of the apparatus used for carrying out the present invention.

Referring to Figure 4, a reel 14 of the wrapping film 10 is supported at one side of the input end of the wrapping machine, and from this reel, the film is drawn over a tensioning arrangement indicated at 16, to a folding mechanism 18, which produces a longitudinally extending center fold 20 (see Figure 2) along the center line "A"—"A" of the film. In this way, the wrapping film is formed into two overlying layers 22 and 24, the width of the folded film being considerably greater than the overall length of the finished pack to be produced. Also, it will be observed, that as a result of the folding action, a series of cut-aways appear along the folded edge 20 of the film, these cut-aways

being created by the holes 12.

During the folding of the film, opening members (not shown in Figure 4) may be inserted between the layers 22 and 24 of the film, as described in the Specification of United Kingdom Patent No: 1,438,961. The folded film passes under a sealing and severing head 26, which is fully described in the Specification of United Kingdom Patent No: 1,438,952, and at this stage, transverse seals are formed across the two layers of film 22 and 24 at positions indicated by dotted lines 28 in Figure 2, each such seal coinciding with the mid length of one of the holes 12 in the film. In addition to sealing the two layers of film together along the lines 28, the sealer head also severs through the two layers of film along each of the lines 28, so that separate wrapping bags 30 (see Figure 3) are formed, each such bag having an open end 32, laterally sealed side edges 34 and 36, a "crotch" portion 38 at the end opposite to the open end 32, and two cut-away corners 40 and 42. By the sealing and severing action, each such wrapping bag, is severed from the bag preceding it, and from the supply of film following it through the machine.

After formation of the bag 30, the opening members are operated, to distend the bag, so that it forms a substantially rectangular cross-section, and at this stage, the bag itself has the appearance of a pair of shorts or briefs, with a trunk portion between the seals 34 and 36, and "leg holes" formed by the cut-away corner portions 40 and 42, with the "crotch" portion 38 between them. If opening members are not employed, a nozzle may direct a blast of air into the bag for the purpose of opening it, but this is not particularly successful with a bag having the cut-away portions 40 and 42 at the center folded end, and it is preferred to use physical opening members as described in United Kingdom Patent No: 1,438,951.

The bottles to be wrapped are indicated at 50 in Figure 4, and they are caused to travel along a conveyor in three rows as indicated, and at the position where each of the wrapping bags 30 is being distended, the bottles are pushed into the opened mouth 32 of each bag, in batches of six, arranged in two rows of three. The actual pushing mechanism may be conventional, or the invention may employ the chicane effect described in United Kingdom Patent Specification No: 1,430,943 whereby at the same time as the bottles are pushed into the bag, the bag is drawn over the bottles. In any event, it will probably be necessary to provide some form of guides entering each bag, to locate the bottles relatively to the bag, since on the machine illustrated in Figure 4, it will be appreciated that the bottles are travelling longitudinally, at the same time as they are being fed laterally into the bag 30.

The machine illustrated in Figure 4 pushes each set of six bottles into its bag, so that the first two bottles to enter the bag are pressed against the end of the bag opposite to the open mouth, and hence each of these two bottles will project

partially through one of the holes formed by the cut-away portions 40 and 42. It will be appreciated of course, that the holes must not be of such a depth or width that the bottles could be pushed completely through them, but it is possible for the depth of each hole to be almost equal to the depth of one of the bottles, and for the width of the hole to be almost equal to the diameter of one of the bottles. At the same time, the length of each pack, which is determined by the width of the folded and distended bag, is such, that the open-end 32 of the bag projects just beyond the outsides of the last two bottles to enter the bag.

From the packaging machine illustrated in Figure 4, the packages travel through a conventional shrink wrap tunnel, in which hot air is directed on to the pack, causing the wrapping material to shrink. When the packs leave the shrink wrapping tunnel, each has the appearance illustrated in Figure 5. The marginal portions of the film around the open end 32 of the pack shrink on to the outer ends of the two last bottles to enter the bag, firmly gripping that end of the collection of six bottles, and leaving a single large generally rectangular hole through which two of the bottles are visible. This end of the pack is not visible in Figure 5.

At the opposite end of the pack, the marginal portions of the film around the cut-away portions 40 and 42, and the crotch portion 38 shrink into engagement with the ends of the first two bottles to enter the pack, tightly gripping on to that end of the collection of bottles (so that the bottles are pressed together endwise between the two shrunk ends of that bag) and leaving two large generally oval holes 52 and 54, through which substantial portions of the first two bottles to enter the pack are clearly visible.

If the bag 30 were not formed with cut-away portions 40 and 42, then the closed corners of the bag would form ears when the set of six bottles is pressed into the bag. Those ears would subsequently be flattened against either the end or the sides of the bag, but as previously mentioned, would present an unsightly appearance. By simply removing the material which would form the ears, leaving the holes 52 and 54, the problem of ear formation does not arise.

At the same time that the bag shrinks endwise it also shrinks circumferentially, so that it is pressed tightly on to the tops and bottoms of the bottles, and on to the leading and trailing sides of the set of six bottles, thus ensuring that the collation of bottles is tightly held together as a single unit.

This provides a very neat and effective pack, and if the wrapping film 10 is transparent, or at least translucent, then the labelling on the bottles is visible through the wrapping film, so that it is easy to identify the contents of the pack. It is possible to preprint advertising or other matter on the wrapping film, particularly if the film is made opaque.

A pack formed in this manner, and as illustrated

in Figure 5, is very easily manipulable, without substantial risk of bottle breakage, and the crotch portion provides a finger grip. Moreover, the pack is eminently suitable for display in a supermarket.

In a refinement, the wrapping film may be provided with one or more rows of additional holes indicated in dotted lines at 56 and 58 in Figures 1 and 3, these holes being adapted to produce additional openings, coinciding with the two center bottles of each pack, as illustrated in dotted lines in Figure 5. Such additional holes, may be employed, partly as a means of reducing the amount of wrapping material necessary to produce each pack, and partly as a means of further exposing the bottles in the finished pack. Indeed, it is possible to envisage a refined form of the invention, in which the wrapping film virtually comprises an open meshwork, which in the finished pack, provides only the essential tensioning elements, for pulling the bottles towards each other, for the purpose of forming a unitary collection. Thus for example, there could be large holes formed in the sides of the pack, corresponding to each of the bottles, a second set of holes, corresponding to each cap of the bottles, leaving only a circumferential rim gripping portion, and a third set of holes, corresponding to each base of the set of bottles, again leaving only a circumferential rim gripping portion for each bottle.

It is to be understood, that instead of employing a shrink wrapping tunnel, it would be possible to form the bag 30 of stretchable material, in which case the bag as formed would be somewhat smaller than that required to encompass the set of six bottles.

The closed corners of the bag are removed by holes preformed in the stretchable material, but these holes will be somewhat smaller than the holes 12 formed in the film of shrinkable material. As the bottles are pressed onto the bag, the bag is then stretched, into tight engagement with the bottles. Because the corners of the bag have been removed, it is possible to distend the bag to a greater extent at the closed end than would otherwise be possible. The cut-away corners form relatively narrow slits in the finished pack. The finished appearance of the pack formed by this stretching method, will be somewhat similar to that of the pack shown in Figure 5, although it is thought that the shrinking process will give a superior pack appearance.

It will also be understood, that the method described above, with reference to Figures 1 to 5 of the drawings, could be employed for wrapping articles other than bottles, for example cans or cartons.

Turning now to Figures 6 to 9 of the drawings, there is illustrated a method of providing a protective wrapping on a bottle 60 containing a carbonated beverage. The bottle 60 is generally of conventional construction, excepting that it will be noted it has a relatively large diameter body portion, and such bottles are sometimes made to hold two litres of a beverage. The bottle has the

usual necked portion.

Bottles of this nature, containing carbonated beverages, present something of a risk, particularly in a super market. If such a bottle is dropped, and breaks, owing to the relatively high pressure developed by the dissolved carbon dioxide, parts of the broken bottle may be propelled at considerable velocity, and hence are liable to injure persons in the vicinity of the accident. In an attempt to meet this problem, it has been proposed to provide protective wrappings around the bottles, but the problem is to provide a wrapping which has a smooth appearance, which will not detract from the appearance of the bottle itself.

For this purpose, film 62 (see Figure 6) which again may be made of polyvinylchloride or polyethylene, and which is shrinkable under heat, is provided in long lengths, and supplied on reels. The width of the film 62, is somewhat greater than twice the depth of the body portion 64 of each bottle 60, and a series of longitudinally spaced circular holes 66 is formed in the film 62, along the longitudinal centre line "B"—"B" of the film. A series of smaller holes 68 is formed in a circle around each of the large holes 66, as illustrated in Figure 6, two of the holes 68 appertaining to each large hole 66, lying on the longitudinal centre line "B"—"B".

A machine illustrated in Figure 8 is used for wrapping the bottles 60, and generally, this machine is also constructed as described in the Specifications of United Kingdom Patents Nos: 1,438,951; 1,430,943; 1,438,952 and 1,438,953. Again therefore, it is intended to incorporate the complete disclosure of those United Kingdom Patent Specifications in the present specification. A reel 70 of the film 62 is mounted at one side of the input end of the machine, and again as in the previous example, this film is drawn over a tensioning device 72, and then over a centre fold arrangement 74, which folds the film along the longitudinal centre line "B"—"B" as illustrated in Figure 7, so that there are overlying layers 76 and 78. As a result of the folding of the film, there are large cut-away portions corresponding to the holes 66, and smaller cut-away portions corresponding to those holes 68 which coincide with the center line "B"—"B" along the folded edge of the film.

Again, as in the previous example, opening members (not shown) are inserted between the two layers of film 76 and 78 and the folded film passes under a sealing and severing head 80. During its traverse under the sealing head 80, the film is sealed along transverse Y-shaped lines indicated at 82 in Figure 7, so that there is a single large cut-away portion and a corresponding series of small holes, in each of the film sections between adjacent seals 80. Moreover, as in the previous example, the film is severed along the lines of the seals 82, so that individual bags are formed, each of which has an open end, and a partially closed end, and triangular portions 83 are discarded, the bag thus having an inwardly tapered closed end.

The bottles 60 travel in a single file along a conveyor, alongside the part of the machine where the bags are formed out of the film, and during this traverse, each bottle is turned to lie in a horizontal position, with its mouth facing towards the line of bags. The opening mechanism of each bag is operated, so as to open the mouth of that bag, and then the bottle is pushed into the bag, and if necessary, the bag is at the same time drawn over the bottle, until the neck of the bottle protrudes through the hole 66. At that stage the inwardly tapered portion of the bag around the hole 66 engages with the neck of the bottle. At that stage the open end of the bag will slightly overlap the bottom end of the bottle.

From the packaging machine illustrated in Figure 8, each bag containing its bottle 60, passes through a shrink wrapping tunnel, and in that tunnel, the bag shrinks on to the exterior of the bottle. The marginal portion of the bag around the open end, will shrink onto and into engagement with the bottom end of the bottle, leaving a substantially rectangular or circular hole in the wrapping underneath the bottle, and the major portion of the bag will shrink tightly on to the body of the bottle. The upper end of the bag, adjacent to the hole 66, shrinks on to that portion of the bottle, where the body is merging into the neck (i.e. the portion where there is a considerable change in the cross-sectional shape of the bottle) but owing to the presence of the small holes 68, the puckering or distortion of the wrapping film which could be expected to occur at this position is at least substantially reduced, and in some cases entirely eliminated.

The wrapping film which thus closely surrounds the body of the bottle provides a protective enclosure, so that if the bottle is accidentally broken, there is considerable resistance to fragmentation and projection of parts of the broken bottle. In addition, if the wrapping film is transparent or translucent, it is possible to view the labelling on the bottle through the wrapping material, and hence a pack is produced, which is at least as pleasing as that of the bottle itself.

Again, it will be appreciated, that the bag could be formed in stretchable material, in which case it would be preformed to a size somewhat smaller than that of the bottle, and would be stretched by the insertion of the bottle. Again however, it is thought that the shrink wrapping method will produce superior results.

It is to be understood, that although a bottle 60 has been illustrated, the method of wrapping described with reference to Figures 6 to 9, could be used to wrap other articles, in which there is an appreciable change in cross-sectional area, at some point. Obviously, the positioning of the small holes 68, must be such, as to coincide with the expected distortion of the wrapping material in the finished pack.

Both methods described above have employed centre folded wrapping film. It is to be understood however, that two separate layers of film could be employed, these two layers being brought into

overlying relationship and then transversely sealed to produce separate bags. If separate layers of film are used, then the cut-away corners such as 40 and 42 will appear as notches in the edge of each film rather than as holes along the centre of the film.

CLAIMS

1. A method of forming a pack comprising a solid article, or a collation of solid articles, closely embraced by a wrapping, in which the wrapping is shaped so that it has no substantial excess material to form ears or otherwise distort the smooth fitting of the wrapping on to the article or collation.

2. A method of forming a pack as claimed in Claim 1, comprising preforming the wrapping to the required shape before the article or collation is inserted into it.

3. A method of forming a pack as claimed in Claim 1 or Claim 2, in which the wrapping is formed into an open-ended tube before the article or collation is inserted into it.

4. A method of forming a pack as claimed in Claim 3, comprising preforming the wrapping into a bag open at one end and having cut-away portions at what would otherwise be the closed corners of the bag, before the article or collation is inserted into it, and forcing the article or collation into the bag to tension the closed end of the bag, whereby the edges of the cut-away portions engage on the exterior of the article or collation.

5. A method of forming a pack as claimed in any one of Claims 1 to 4, comprising the further step of stressing the wrapping around the article or collation.

6. A method of forming a pack as claimed in Claim 5, in which the wrapping is shrunk onto the article or collation.

7. A method of forming a pack as claimed in Claim 5, in which the wrapping is stretched around the article or collation.

8. A method of forming a pack as claimed in any one of Claims 1 to 7, including the step of forming one or more cut-away portions in the wrapping additional to any such cut-away portions required to obviate ears or other distortions.

9. A method of forming a pack containing a plurality of solid articles, comprising the steps of; forming a bag open at one end and having cut-away portions at what would otherwise be the closed corners of the bag; inserting a plurality of articles formed into a collation through the open-end of the bag and tensioning the bag around the articles so that the edges of the open mouth of the bag contract onto at least one of the plurality of articles and engage with that end of the plurality of articles, and so that the edges of the cut-away portions engage with the opposite end of the plurality of articles.

10. A method of forming a pack containing an article of varying cross-sectional shape, comprising the steps of forming a tube of wrapping material, with one or more holes in the material at positions corresponding to areas of

reduced cross-section of the article, inserting the article into the tube, and stressing the tube on the outside of the article, so that the holes substantially remove what would otherwise be excess wrapping material, which would distort the wrapping.

11. A method of forming a pack as claimed in Claim 10, in which the tube is closed at one end, so that it forms a bag, the article being introduced through the open-end of the bag.

12. A pack produced by the method of any one of Claims 1 to 11, and comprising a solid article or a collation of articles, closely embraced by a wrapping shaped so that it has substantially no excess material to form ears or otherwise distort the smooth fitting of the wrapping on the article or collation of articles.

13. A method of forming a wrapping for packaging goods, comprising; forming a series of longitudinally spaced holes in a length of wrapping film; folding the film along a longitudinal line passing through the series of holes, so that the two parts of the film on opposite sides of the fold line are brought into overlying relationship with each other; traversing the film in a longitudinal direction, and forming seals between these two parts of the film along transverse lines each of which intersects one of the series of holes, so that each wrapping between adjacent seals comprises a bag open along one longitudinal edge and having cut-away portions at what would otherwise be the closed corners along the opposite longitudinal edge.

14. A method of forming a wrapping as claimed in Claim 13, in which the wrapping is severed along each transverse seal, so that each bag is completely detached from the bag in front of it and from the film supply following it.

15. A method of forming a wrapping as claimed in Claim 12 or Claim 13, in which one or more additional series of longitudinally spaced holes is or are formed in the wrapping film, along lines laterally spaced from the first series of holes.

16. The packaging material comprising a long length of wrapping film having a series of longitudinally spaced holes formed in it, the width of each hole lying within the range 10% to 30% of the width of the film, the lateral position of the series of holes being such that the longitudinal centre line of the film passes through the holes.

17. A packaging material as claimed in Claim 16, in which the length of each hole lies within the range 10% to 30% of the width of the film.

18. A method of forming a pack substantially as herein described with reference to Figures 1 to 5 of the accompanying drawings.

19. A method of forming a pack substantially as herein described with reference to Figures 6 to 9 of the accompanying drawings.

20. A method of forming a wrapping for packaging goods substantially as herein described with reference to Figures 1 to 3 of the accompanying drawings.

21. A method of forming a wrapping for packaging goods substantially as herein described

with reference to Figures 6 and 7 of the accompanying drawings.

22. A packaging material substantially as herein described with reference to Figure 1 of the

5 accompanying drawings.

23. A packaging material substantially as herein described with reference to Figure 6 of the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1980. Published by the Patent Office,
25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

THIS PAGE BLANK (02/80)

THIS PAGE BLANK (USPTO)

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKewed/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.

THIS PAGE BLANK (USPTO)